

DuDrive Series TSHP-60



Trunsun High Efficiency Polycrystalline Half-cut Cell Solar Module
275-290W



Higher Module Efficiency

Brings 5-10W power gain due to half-cut production system



More Energy Yield

Lower NMOT and better temperature coefficient by lower cell series resistance, helps boost energy yield



Lower Operating Temperature, More Reliable

Lower operating temperature and hot spot temperature during the sunny day, making the module prevail during the sunny days



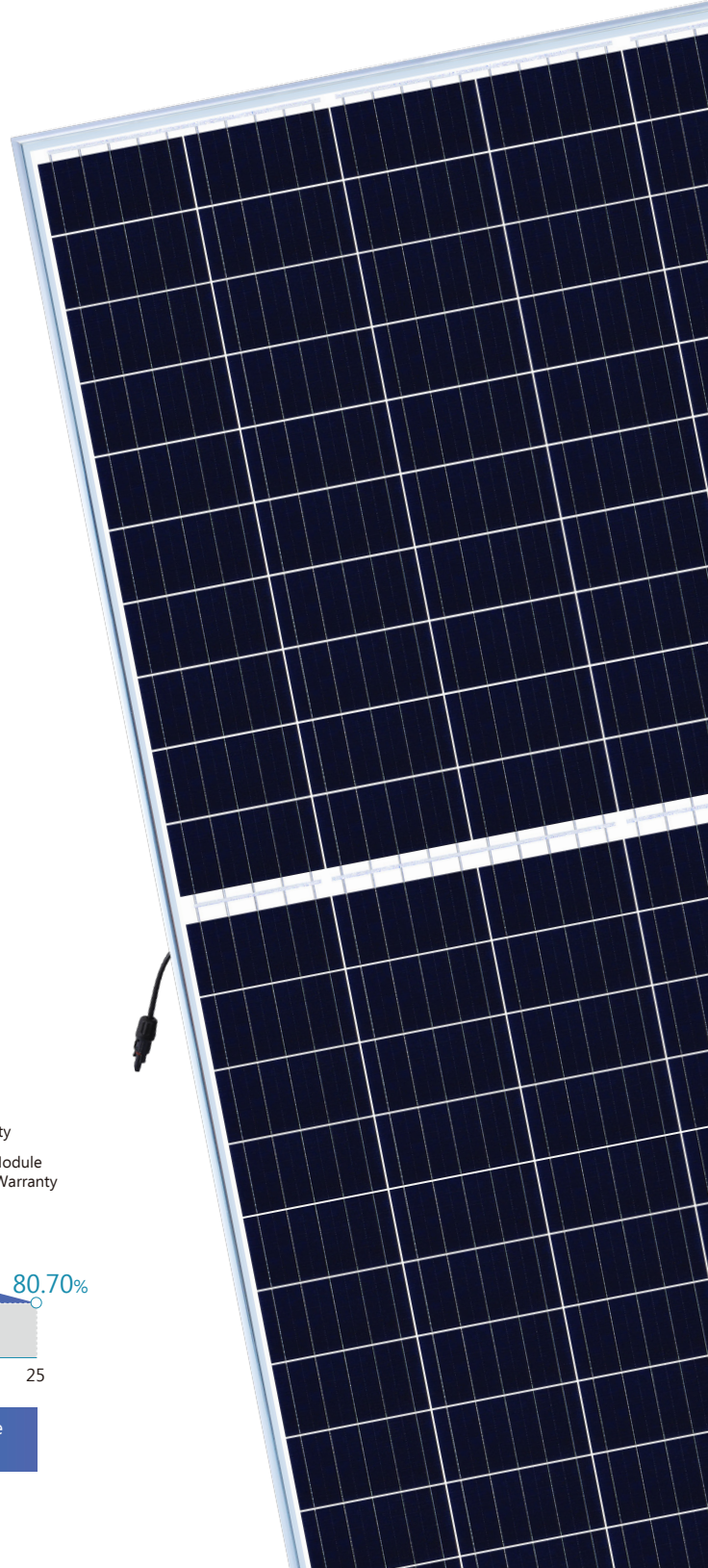
Better Shading Tolerance

Thanks to Paralleling circuit design, more power generated under shading condition and during morning & evening time

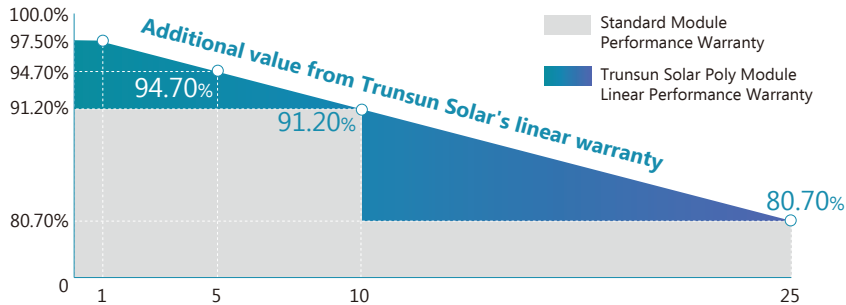


Better Micro Crack Resistance

Minimize the impact by micro crack by limiting cell damage and potentially extending area by half-cut module architecture



LINEAR PERFORMANCE WARRANTY



12years Product Material & Workmanship

25years Linear Performance Warranty

About Trunsun Solar

Trunsun Solar, established in 2008, is dedicated to providing solar products with high quality, excellent performance and strong after-sales support. The company not only has strong financial support but also never stops innovating. Trunsun Solar will keep delivering the diversified solar products for all kinds of renewable energy generation systems around the world.

DuDrive Series TSHP-60 Trunsun High Efficiency Polycrystalline Half-cut Cell Solar Module

ELECTRICAL DATA @ STC		TSHP275-60	TSHP280-60	TSHP285-60	TSHP290-60
Peak Power (Pmax)	(W)	275	280	285	290
Maximum Power Voltage (Vmp)	(V)	31.87	32.15	32.43	32.7
Maximum Power Current (Imp)	(A)	8.63	8.71	8.79	8.87
Open-circuit Voltage (Voc)	(V)	38.14	38.42	38.69	38.98
Short-circuit Current (Isc)	(A)	9.2	9.27	9.35	9.42
Module Efficiency	(%)	16.52	16.82	17.12	17.42
Operating Temperature		-40°C~+85°C			
Maximum System Voltage		1000V			
Maximum Series Fuse Rating		15A			
Application Class		Class A			
Power Tolerance		0~+3%			

*STC (Standard Test Condition): Irradiance 1000W/ m², Module Temperature 25°C, AM 1.5

ELECTRICAL DATA @ NMOT		TSHP275-60	TSHP280-60	TSHP285-60	TSHP290-60
Peak Power (Pmax)	(W)	204	207	211	215
MPP Voltage (Vmp)	(V)	29.42	29.68	29.93	30.18
MPP Current (Imp)	(A)	6.93	6.99	7.05	7.12
Open Circuit Voltage (Voc)	(V)	35.83	36.09	36.35	36.62
Short Circuit Current (Isc)	(A)	7.45	7.51	7.57	7.63

*Under Nominal Module Operating Temperature (NMOT), Irradiance of 800W/ m², Spectrum AM 1.5, Ambient Temperature 20°C, Wind Speed 1m/s

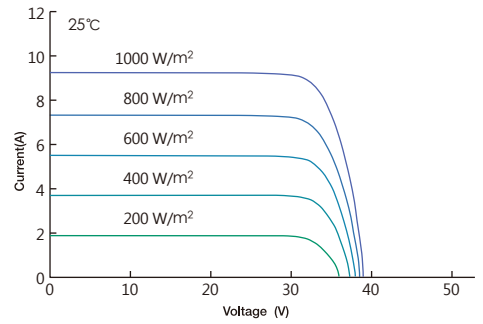
TEMPERATURE CHARACTERISTICS	
Temperature coefficient of Pmax	-0.39%
Temperature coefficient of Voc	-0.33%
Temperature coefficient of Isc	0.05%
NMOT	42±3°C

MECHANICAL DATA	
Cell Type	Poly-Crystalline, 156.75×78.38mm
Cell Arrangement	120pcs (2×(6×10))
Dimension (L×W×H)	1680×991×35mm
Weight	19kg
Front Cover	3.2mm Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP67, 3 Bypass Diodes
Cable Type	4mm ²
Length of Cable	1160mm
Connector	PV Connector

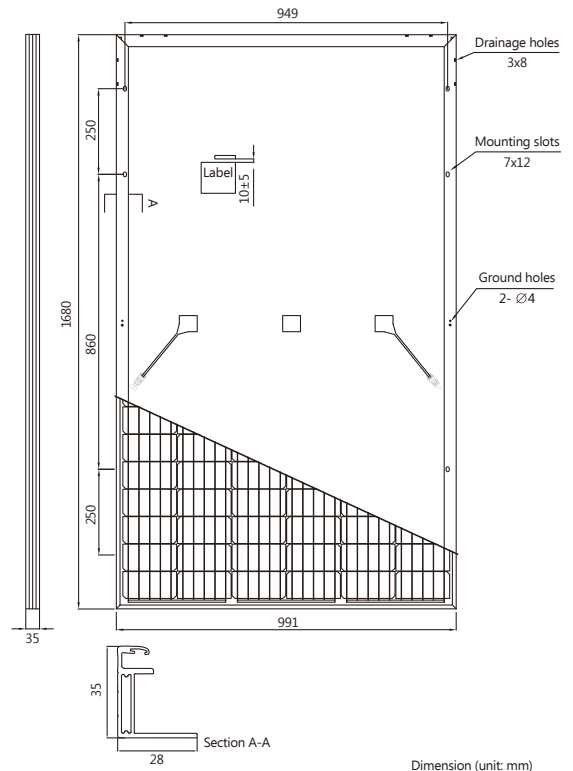
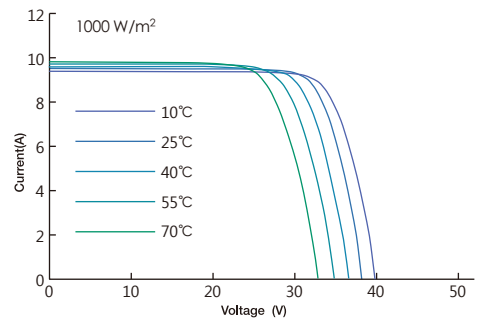
PACKING MANNER	
Packing Type	40HQ
Piece/Pallet	30
Pallet/Container	26
Piece/Container	780

*The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to ongoing innovation, R&D enhancement, Zhejiang Trunsun Solar Co., Ltd. Reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the most recent version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.

Current-Voltage Curve under different irradiance



Current-Voltage Curve under different working temperatures

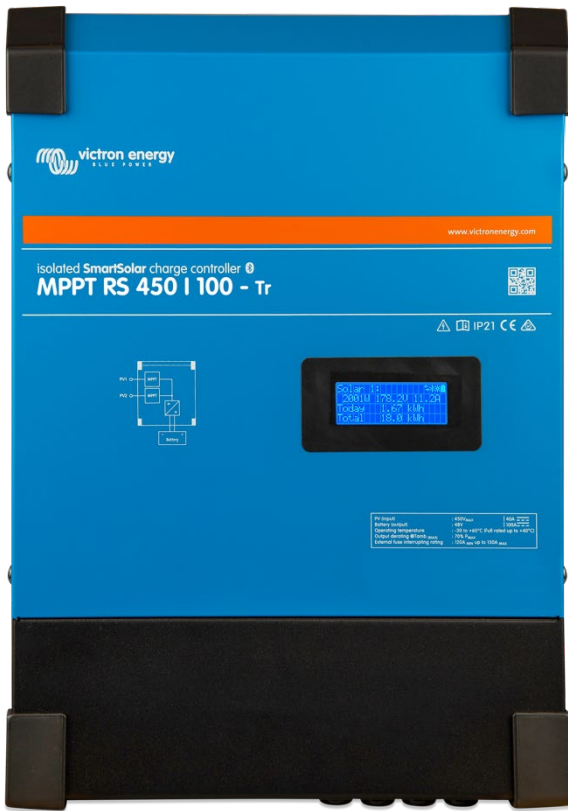


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SmartSolar MPPT RS 450|100 & 450|200 - Isolated

5.76kW & 11.52kW Solar Charge Controller with 450V PV input

www.victronenergy.com



SmartSolar MPPT RS 450|100

Ultra-fast Maximum Power Point Tracking (MPPT) Solar Charge Controller

The MPPT RS SmartSolar is a 48V Solar charge controller with up to 450VDC PV input and either 100A, or 200A output. It is used in on-grid and off-grid solar applications where maximum battery charging power is required.

Multiple independent MPPT tracking inputs

With multiple MPPT trackers, you can optimize your solar panel design for maximum performance for your specific location.

Isolated PV connections for additional safety

Full galvanic isolation between PV and battery connections provide additional overall system safety.

Wide MPPT voltage range

80 – 450 VDC PV operating range, with a 120VDC PV startup voltage.

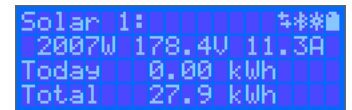
Light weight, efficient and quiet

Thanks to high frequency technology and a new design this powerful charger weighs only 7.9 kg for the 100A model. In addition to this it has an excellent efficiency, low standby power, and a very quiet operation.

Display and Bluetooth

The display reads battery, and solar charge controller parameters.

The parameters can be accessed with a smartphone or other Bluetooth enabled device. In addition, Bluetooth can be used to set up the system and to change settings with VictronConnect.



PV Isolation resistance monitoring for peace of mind at higher voltages

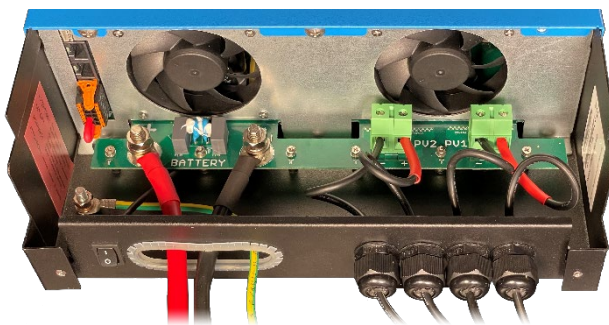
The MPPT RS continuously monitors the PV array and can detect if there are faults that reduce the isolation of the panels to unsafe levels.

VE.Can and VE.Direct port

For connection to a GX device for system monitoring, data logging, and remote firmware updates. VE.Can allows for up to 25 units to be connected together in parallel and synchronize their charging.

I/O Connections

Programmable Relay, temperature sensor, auxiliary, digital input and voltage sensor connections. The remote input can accept the Victron smallBMS, and other BMS with allow-to-charge signal.



Inside the SmartSolar MPPT RS 450|100

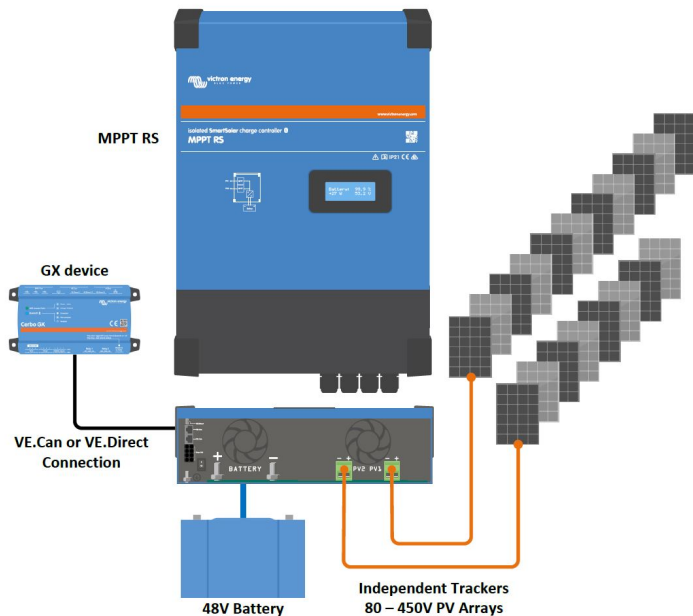
Configure and monitor with VictronConnect

A built-in Smart Bluetooth connection allows for quick monitoring or settings adjustment of the MPPT RS.

The built in 30 day history shows individual performance of the separate MPPT trackers.

Try the VictronConnect demo to see the full range of configuration and display options with sample data.



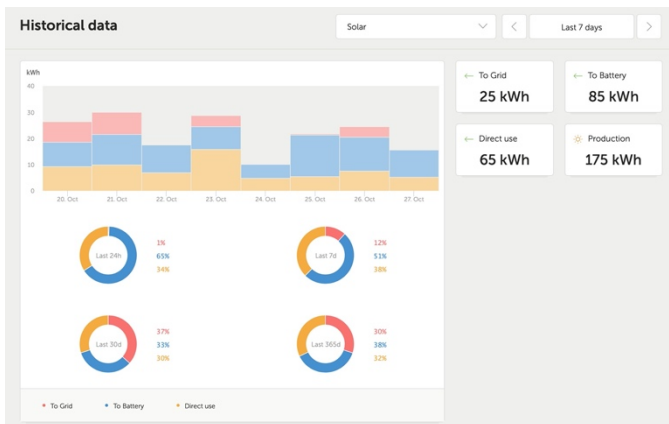
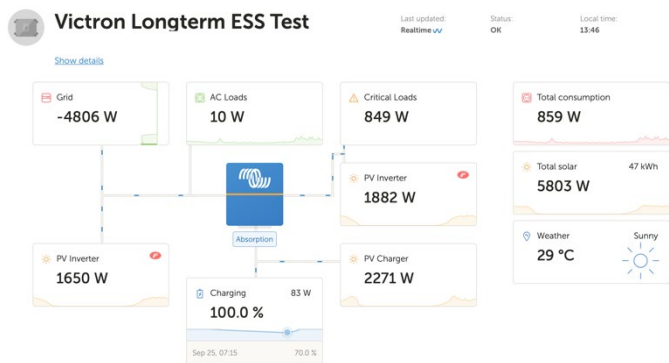


System example diagram

The 100A MPPT RS combined with a GX device, charging a 48V battery with 2 separate solar PV strings.

VRM Portal

When the MPPT RS is connected to a GX device with internet connection, or the GlobalLink 520 with built in 4G connectivity, you can access our free remote monitoring website (VRM). This will display all your system data in a comprehensive graphical format. Alarms can be received by e-mail.



Isolated SmartSolar MPPT RS	450 100	450 200
CHARGER		
Programmable charger voltage range ⁽¹⁾	Minimum: 36 V Maximum 62 V	
Charge voltage 'absorption'	default: 57,6 V	
Charge voltage 'float'	default: 55,2 V	
Maximum charge current	100 A	200 A
Battery temperature sensor	Included	
SOLAR		
Maximum DC PV voltage	450 V	
Start-up voltage	120 V	
MPPT operating voltage range	80 - 450 V ⁽¹⁾	
Number of trackers	2	4
Maximum operational PV input current	18 A per tracker	
Max. PV short circuit current reverse polarity protection ⁽²⁾	20 A per tracker	
Maximum DC output charging power	4000 W per tracker 11520 W total 100 A at 57.6 V / 200 A at 57.6 V	
Maximum PV array size per tracker ⁽³⁾	7200 Wp (450 V x 20 A) ⁽³⁾	
PV Isolation fail level ⁽⁴⁾	100 kΩ	
GENERAL		
Synchronised Parallel Operation	Yes, up to 25 units with VE.Can	
Programmable relay ⁽⁵⁾	Yes	
Protection ⁽⁶⁾	a, b, c	
Data Communications	VE.Direct port, VE.Can port & Bluetooth ⁽⁷⁾	
General purpose analogue/digital in port	Yes, 2x	
Remote on-off	Yes	
Operating temperature range	-40 to +65°C (fan assisted cooling)	
Humidity (non-condensing)	max 95%	
ENCLOSURE		
Material & Colour	steel, blue RAL 5012	
Protection category	IP21	
Battery-connection	M8 bolts	
Weight	7.9 kg	13.7 kg
Dimensions (h x w x d)	440 x 313 x 126 mm	487 x 434 x 146 mm
STANDARDS		
Safety	EN-IEC 62109-1, EN-IEC 62109-2	

1) MPPT operating range is also constrained by battery voltage - PV VOC should not exceed 8x battery float voltage. For example, a 52,8V float voltage results in a maximum PV VOC of 422,4V. See product manual for further information.

2) A higher short circuit current may damage the controller if PV array is connected in reverse polarity.

3) Max. 450 Voc result in appr. 360 Vmpp, therefore the maximum PV array is appr. 360V x 20A = 7200Wp

4) The MPPT RS will test for sufficient resistive isolation between PV+ and GND, and PV- and GND. In the event of a resistance below the threshold, the unit will stop charging, display the error, and send the error signal to the GX device (if connected) for audible and email notification.

5) Programmable relay which can be set for general alarm, DC under voltage or genset start/stop function. DC rating: 4A up to 35VDC and 1A up to 70VDC

6) Protection key:
 a) battery voltage too high
 b) battery voltage too low
 c) temperature too high

7) The MPPT RS is not currently compatible with VE.Smart Networks